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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,223	03/24/2004	Takeo Arai	08830.0017	3313
22852	7590	05/02/2006	EXAMINER	
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			LIANG, LEONARD S	
			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 05/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/807,223

Applicant(s)

ARAI, TAKEO

Examiner

Leonard S. Liang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 14-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119.

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/16/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Election/Restrictions

In the response to election/restriction filed on 04/19/06, the applicant has elected claims 1-13 without traverse. The examiner will therefore examine claims 1-13 and all other claims will be withdrawn from consideration.

Specification and Drawings

The lengthy specification and drawings have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification and drawings. Specifically, the applicant is required to match all references in the drawings to the references in the specification.

Claim Objections

Claim 10 is objected to because of the following informalities: The claim discloses "wherein the curing section includes a plurality of cure devices corresponding to each recording **heads**." This is not correct grammar. It will be construed that the claim should state "wherein the curing section includes a plurality of cure devices corresponding to each recording **head**." Appropriate correction is required.

Claim Rejections - 35 USC § 103

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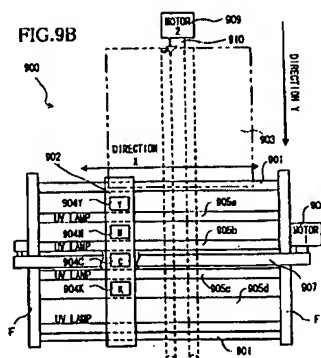
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 5, 8-9, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al.

Asano et al discloses:

- {claim 1} An image recording device (figure 9B); a first recording head which discharges a first ink for a first image forming process (figure 9B); a second recording head which discharges a second ink for a second image forming process (figure 9B); a curing section which cures an ink on a recording medium (figure 9B, reference "UV lamp")



- {claim 2} wherein the controller controls at least one of the first recording head and the second recording head so as to overlap at least part of a first recording area of the first image forming process and a part of a second recording area of

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the second image forming process in an arbitrary area on a recording surface of the recording medium (column 2, lines 34-37)

- {claim 5} wherein the controller controls either the first recording head or the second recording head so as to record in all of an arbitrary area of the recording medium (column 2, lines 19-53)
- {claim 8} wherein the curing section cures the first ink and the second ink on the recording medium (figure 9B, reference "UV lamp")
- {claim 9} wherein the curing section includes a first cure device for the first image forming process and a second cure device for the second image forming process (figure 9B, reference "UV lamp")
- {claim 11} wherein the first recording head and the second recording head are extending in a width direction of the recording medium (figure 9B)
- {claim 12} wherein each of the first and second ink is an ultraviolet-ray curable ink, which is cured as irradiated with ultraviolet rays, and the curing section includes an ultraviolet light source which generates ultraviolet rays to cure the ultraviolet-ray curable ink
- {claim 13} a moving section which relatively moves the recording medium to the first and second recording head and/or the curing section

Asano et al does not explicitly disclose:

- {claim 1} a controller which controls the curing section to cure the first ink on the recording medium, and controls the second recording head to start

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discharging the second ink after a conversion of the first ink on the recording medium becomes not less than 30 %

However, this limitation is naturally suggested in light of the teachings of Asano et al in column 2, line 19 – column 3, line 61. The purpose of Asano et al is to cure a color of ink before printing another color over it. This prevents color mingling and helps maintain good image quality. Although it's not explicitly disclosed, the inks would likely have to be cured to above 30% conversion before the next ink is ejected.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Asano et al. The motivation for the skilled artisan in doing so is to gain the benefit of shortening the time of curing and preventing color mingling (column 2, lines 19-23).

Claims 3-4, 7, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al, as applied to claim 1, and further in view of Fuqua (US Pat 6152030).

Asano et al discloses:

- {claim 7} a third recording head which discharges a third ink for either the first image forming process or the second image forming process; a fourth recording head which discharges a fourth ink for same process of the third recording head (figure 9B)
- {claim 10} wherein the curing section includes a plurality of cure devices corresponding to each recording head (figure 9B, reference "UV lamp")

Asano et al differs from the claimed invention in that it does not disclose:

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- {claim 3} wherein a color of the first ink or the second ink is white
- {claim 4} wherein one of the first image forming process and the second image forming process is a process for an image, the other is a process for a background
- {claim 7} a fifth recording head which discharges a fifth ink for same process of the third recording head

Fuqua discloses:

- {claim 3} wherein a color of the first ink or the second ink is white (column 3, lines 34-46)
- {claim 4} wherein one of the first image forming process and the second image forming process is a process for an image, the other is a process for a background (column 3, lines 34-46; white ink used for background)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Fuqua into the invention of Asano et al. The motivation for the skilled artisan in doing so is to gain the benefit of being able to print on dark substrates by first applying a layer of white ink and then printing on that layer. Assuming that white ink is used as a fifth color along with the typical black, cyan, magenta, and yellow inks, it is naturally suggested that there is a fifth recording head which discharges a fifth ink for same process of the third recording head.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al, as applied to claim 1, and further in view of Manini et al (US Pat 6084609).

Asano et al teaches all limitations of the claimed invention except for the following:

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- {claim 6} wherein the first recording head and the second recording head include a plurality of nozzles for an ink discharge, and a diameter of ink at the 100% conversion of the ink is not less than 140% of a distance between centers of adjacent nozzles of the first recording head or the second recording head

Manini et al discloses, with respect to claim 6, "droplets of ink print dots have a diameter D on a printing medium, wherein said center of said each nozzle is arranged by having a distance with respect to the center of any other nozzle of said plurality of nozzles lower than said diameter D of said dots but higher than 0.4 times said diameter D." Here, it is implied that the diameter of the ink is more than the distance between centers of adjacent nozzles. Hence, the claim limitation is naturally suggested.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to Manini et al into the invention of Asano et al. The motivation for the skilled artisan in doing so is to gain the benefit of obtaining increased print quality.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lutz (US Pat 6248804) discloses ultraviolet and/or visible light curable inks with photoinitiators for game balls, golf balls and the like.

Pond (US Pat 6344819) discloses a heliographic ink jet apparatus and imaging processes thereof.

Morgavi (US Pat 6562413) discloses ink cross-linking by UV radiation.

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Mills et al (US PgPub 20030035037) discloses a radiation treatment for ink jet fluids.

Caiger et al (US Pat 6145979) discloses an ink jet printer with apparatus for curing ink and method.

Tanaka (US Pat 4704615) discloses a thermal transfer printing apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard S. Liang whose telephone number is (571) 272-2148. The examiner can normally be reached on 8:30-5 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

04/29/06

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STEPHEN MEIER
SUPERVISORY PATENT EXAMINER